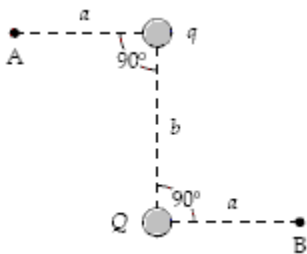


Physics 210 Week 4 Practise Multiple Choice

Multiple Choice

Identify the choice that best completes the statement or answers the question.

- _____ 1. A charged particle ($q = -8.0 \text{ mC}$), which moves in a region where the only force acting on the particle is an electric force, is released from rest at point A. At point B the kinetic energy of the particle is equal to 4.8 J. What is the electric potential difference $V_B - V_A$?
- 0.60 kV
 - +0.60 kV
 - +0.80 kV
 - 0.80 kV
 - +0.48 kV
- _____ 2. Points A [at (2, 3) m] and B [at (5, 7) m] are in a region where the electric field is uniform and given by $\mathbf{E} = (4\mathbf{i} + 3\mathbf{j}) \text{ N/C}$. What is the potential difference $V_A - V_B$?
- 33 V
 - 27 V
 - 30 V
 - 24 V
 - 11 V
- _____ 3. A proton (mass = $1.67 \times 10^{-27} \text{ kg}$, charge = $1.60 \times 10^{-19} \text{ C}$) moves from point A to point B under the influence of an electrostatic force only. At point A the proton moves with a speed of 50 km/s. At point B the speed of the proton is 80 km/s. Determine the potential difference $V_B - V_A$.
- +20 V
 - 20 V
 - 27 V
 - +27 V
 - 40 V
- _____ 4. Point charges q and Q are positioned as shown. If $q = +2.0 \text{ nC}$, $Q = -2.0 \text{ nC}$, $a = 3.0 \text{ m}$, and $b = 4.0 \text{ m}$, what is the electric potential difference, $V_A - V_B$?



- 8.4 V
 - 6.0 V
 - 7.2 V
 - 4.8 V
 - 0 V
- _____

5. Identical $4.0\text{-}\mu\text{C}$ charges are placed on the y axis at $y = \pm 4.0$ m. Point A is on the x axis at $x = +3.0$ m. Determine the electric potential of point A (relative to zero at the origin).
- -4.5 kV
 - -2.7 kV
 - -1.8 kV
 - -3.6 kV
 - -14 kV
- _____ 6. Particle A (mass = m , charge = Q) and B (mass = m , charge = $5Q$) are released from rest with the distance between them equal to 1.0 m. If $Q = 12\ \mu\text{C}$, what is the kinetic energy of particle B at the instant when the particles are 3.0 m apart?
- 8.6 J
 - 3.8 J
 - 6.0 J
 - 2.2 J
 - 4.3 J
- _____ 7. Identical point charges ($+20\ \mu\text{C}$) are placed at the corners of an equilateral triangle with sides of 2.0-m length. How much external energy is required to bring a charge of $45\ \mu\text{C}$ from infinity to the midpoint of one side of the triangle?
- 26 J
 - 16 J
 - 23 J
 - 21 J
 - 12 J
- _____ 8. A charge per unit length given by $\lambda(x) = bx$, where $b = 12\ \text{nC/m}^2$, is distributed along the x axis from $x = +9.0$ cm to $x = +16$ cm. If the electric potential at infinity is taken to be zero, what is the electric potential at the point P on the y axis at $y = 12$ cm?
- 5.4 V
 - 7.2 V
 - 9.0 V
 - 9.9 V
 - 16 V
- _____ 9. A nonuniform linear charge distribution given by $\lambda(x) = bx$, where b is a constant, is distributed along the x axis from $x = 0$ to $x = +L$. If $b = 40\ \text{nC/m}^2$ and $L = 0.20$ m, what is the electric potential (relative to a potential of zero at infinity) at the point $y = 2L$ on the y axis?
- 19 V
 - 17 V
 - 21 V
 - 23 V
 - 14 V

10. A charge of 20 nC is distributed uniformly along the y axis from $y = 0$ to $y = 4$ m. Which of the following integrals is correct for the electric potential (relative to zero at infinity) at the point $x = +3$ m on the x axis?
- $\int_0^4 \frac{45dy}{(y^2 + 9)^{1/2}}$
 - $\int_0^4 \frac{180dy}{(y^2 + 9)^{1/2}}$
 - $\int_0^4 \frac{45dy}{y^2 + 9}$
 - $\int_0^4 \frac{180dy}{y^2 + 9}$
 - $\int_0^4 \frac{45dy}{(y^2 + 9)^{3/2}}$
11. The electric field in a region of space is given by $E_x = (3.0x)$ N/C, $E_y = E_z = 0$, where x is in m. Points A and B are on the x axis at $x_A = 3.0$ m and $x_B = 5.0$ m. Determine the potential difference $V_B - V_A$.
- 24 V
 - +24 V
 - 18 V
 - +30 V
 - 6.0 V

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Answer Section

MULTIPLE CHOICE

- | | |
|------------|--------|
| 1. ANS: B | PTS: 1 |
| 2. ANS: D | PTS: 1 |
| 3. ANS: B | PTS: 1 |
| 4. ANS: D | PTS: 1 |
| 5. ANS: D | PTS: 1 |
| 6. ANS: D | PTS: 1 |
| 7. ANS: D | PTS: 1 |
| 8. ANS: A | PTS: 1 |
| 9. ANS: B | PTS: 1 |
| 10. ANS: A | PTS: 1 |
| 11. ANS: A | PTS: 1 |